

6. The use of active or passive components at the intersection of grid elements such that the electrical characteristics of the detection grid is measurable by the circuit of claim 2 if a subset of such components, or grid elements in the vicinity of such components, are compromised by physical trauma.

7. The design of the detection-grid in claim 1 such that if it is on the outside of the vehicle, it ablates off during re-entry of the vehicle from space into earth's atmosphere. This is inclusive of grids composed in whole or in part of conductive paint, fiber-optic, wire or other materials.

#### ABSTRACT

A detection-grid is disclosed that is part of a vehicle's thermal protection layer, such as that of a space shuttle. A hybrid digital/analog system detects electrical changes in the detection grid caused by mechanical trauma to a vehicle's external surface. The system produces timely and useful display of such events. Furthermore, with redundant verification of such real-time data, the vehicle can detach from other apparatus, such as an external fuel tank or booster rockets, to execute pre-planned glide or descent scenarios maximizing a crew's and vehicle's safe return before proceeding to orbit. The detection-grid ablates off during re-entry of a regular mission.